September 2009

QIAsafe® DNA Blood Handbook

For room-temperature storage and archiving of whole blood for subsequent DNA purification

This product contains DNA SampleMatrix® technology developed by Biomatrica, Inc.

QIAGEN®

Sample & Assay Technologies

QIAGEN Sample and Assay Technologies

QIAGEN is the leading provider of innovative sample and assay technologies, enabling the isolation and detection of contents of any biological sample. Our advanced, high-quality products and services ensure success from sample to result.

QIAGEN sets standards in:

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- Nucleic acid and protein assays
- microRNA research and RNAi
- Automation of sample and assay technologies

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Kit Contents

QIAsafe DNA Blood	Tubes (50)	48-Well Plates (10)
Catalog no.	**159134**	**159142**
Number of preps	**50**	**10 x 48**
QIAsafe DNA Blood Tubes	50	–
QIAsafe DNA Blood Tube Carrier Plate	1	–
QIAsafe DNA Blood 48-Well Plates	–	10
AirPore Tape Sheets	–	10
QIAsafe Desiccant	5	10
QIAsafe Moisture Barrier Bags	5	10
Handbook	1	1

QIAsafe DNA Blood Rehydration Set*	(100)
Catalog no.	**159155**
Number of preps	**100**
QIAGEN® Protease	1 vial
Protease Resuspension Buffer	6 ml
RNase-Free Water	50 ml
Product Sheet	1

* The QIAsafe DNA Blood Rehydration Set is not included with QIAsafe DNA Blood Tubes and 48-Well Plates, and must be purchased separately.

Storage

QIAsafe DNA Blood matrix is a novel formulation for safe, stable, and convenient storage of whole blood at room temperature (15–25°C). Before use, QIAsafe DNA Blood Tubes and 48-Well Plates should be stored dry in their original, unopened packaging.

Upon application of blood, QIAsafe DNA Blood Tubes and Plates need to be stored in an environment with low relative humidity for optimal product performance. Therefore, it is recommended to store tubes or plates in a moisture-barrier bag including a desiccant packet (provided). For extended

storage times (>6 months), moisture-barrier bags should be heat-sealed. Alternatively, tubes or plates may be stored in a dry storage cabinet with relative humidity below 40% (see "Equipment and Reagents to Be Supplied by User", page 9). Storage of opened QIAsafe DNA Blood Tubes and Plates at relative humidity above 40% for extended periods of time will reduce product performance and sample protection.

Lyophilized QIAGEN Protease can be stored at room temperature (15–25°C) for up to 12 months without any decrease in performance. For storage longer than 12 months or if ambient temperatures constantly exceed 25°C, QIAGEN Protease should be stored dry at 2–8°C.

Reconstituted QIAGEN Protease is stable for 2 months when stored at 2–8°C. Keeping the QIAGEN Protease stock solution at room temperature for prolonged periods of time should be avoided. Storage at –20°C will prolong its life, but repeated freezing and thawing should be avoided. Dividing the solution into aliquots and storage at –20°C is recommended.

Product Use Limitations

QIAsafe DNA Blood Tubes and 48-Well Plates are intended for molecular biology applications. These products are neither intended for the diagnosis, prevention, or treatment of a disease, nor have they been validated for such use either alone or in combination with other products. Therefore, the performance characteristics of the products for clinical use (i.e., diagnostic, prognostic, therapeutic, or blood banking) are unknown.

Product Warranty and Satisfaction Guarantee

QIAGEN guarantees the performance of all products in the manner described in our product literature. The purchaser must determine the suitability of the product for its particular use. Should any product fail to perform satisfactorily due to any reason other than misuse, QIAGEN will replace it free of charge or refund the purchase price. We reserve the right to change, alter, or modify any product to enhance its performance and design. If a QIAGEN product does not meet your expectations, simply call your local Technical Service Department or distributor. We will credit your account or exchange the product — as you wish. Separate conditions apply to QIAGEN scientific instruments, service products, and to products shipped on dry ice. Please inquire for more information.

A copy of QIAGEN terms and conditions can be obtained on request, and is also provided on the back of our invoices. If you have questions about product specifications or performance, please call QIAGEN Technical Services or your local distributor (see back cover or visit www.qiagen.com).

Technical Assistance

At QIAGEN, we pride ourselves on the quality and availability of our technical support. Our Technical Service Departments are staffed by experienced scientists with extensive practical and theoretical expertise in sample and assay technologies and the use of QIAGEN products. If you have any questions or experience any difficulties regarding QIAsafe DNA Blood Tubes and 48-Well Plates or QIAGEN products in general, please do not hesitate to contact us.

QIAGEN customers are a major source of information regarding advanced or specialized uses of our products. This information is helpful to other scientists as well as to the researchers at QIAGEN. We therefore encourage you to contact us if you have any suggestions about product performance or new applications and techniques.

For technical assistance and more information, please see our Technical Support Center at www.qiagen.com/Support or call one of the QIAGEN Technical Service Departments or local distributors (see back cover or visit www.qiagen.com).

Safety Information

When working with chemicals, always wear a suitable lab coat, disposable gloves, and protective goggles. For more information, please consult the appropriate material safety data sheets (MSDSs). These are available online in convenient and compact PDF format at www.qiagen.com/Support/MSDS.aspx where you can find, view, and print the MSDS for each QIAGEN kit and kit component.

24-hour emergency information

Emergency medical information in English, French, and German can be obtained 24 hours a day from:

Poison Information Center Mainz, Germany

Tel: +49-6131-19240

Quality Control

In accordance with QIAGEN's ISO-certified Quality Management System, each lot of QIAsafe DNA Blood Tubes and 48-Well Plates is tested against predetermined specifications to ensure consistent product quality.

Introduction

QIAsafe DNA Blood Tubes and 48-Well Plates provide innovative technology for biological sample storage at room temperature. Stabilizing DNA in blood at room temperature saves on refrigeration costs and enables easy transportation and storage.

QIAsafe technology was designed by combining extremophile biology and synthetic chemistry to create a novel dissolvable matrix optimally formulated for long-term ambient temperature storage and shipping of whole blood.

Rehydrated blood samples are ready for immediate DNA purification using standard DNA purification techniques, such as the QIAamp® DNA Blood Mini Kit. The purified DNA is suitable for any downstream application, including PCR, quantitative PCR, and sequencing.

Blood samples stored dry in the QIAsafe DNA Blood matrix are ready for convenient shipping at ambient temperatures, even over extended transit times.

After applying and subsequently drying blood samples on the matrix in QIAsafe DNA Blood Tubes or Plates, DNA is stabilized in situ for years at room temperature (15–25°C), as demonstrated by accelerated aging studies.*† QIAsafe DNA Blood Tubes or Plates can be easily transported, archived, or immediately processed.

Principle and procedure

The QIAsafe DNA Blood procedure consists of 3 parts: sample application, sample storage, and nucleic acid purification. Blood samples are directly applied to the QIAsafe DNA Blood Tubes or Plates. After storage, DNA can be purified using standard DNA purification technologies for whole blood.

The QIAsafe DNA Blood matrix is a mixture of dissolvable compounds that stabilizes DNA at room temperature. The synthetic chemical matrix formulation is based upon the natural principles of anhydrobiosis. Anhydrobiosis, meaning "life without water", is a biological mechanism employed by some multicellular organisms that enables their survival in a dry state for periods over 100 years.‡

* Accelerated aging studies: A temperature increase of 10°C corresponds to a twofold increase in shelf life. For example, DNA stored at 40°C for 2 years corresponds to an estimated storage time of 8 years at 20°C.

† Hemmerich, K.J. (1998) General Aging Theory and Simplified Protocol for Accelerated Aging of Medical Devices. Medical Device Link www.devicelink.com/mpb/archive/98/07/002.html.

‡ Crowe, J.H., Carpenter, J.F., and Crowe, L.M. (1998) The role of vitrification in anhydrobiosis. Annu. Rev. Physiol. **60**, 73.

The QIAsafe DNA Blood matrix forms a protective seal around DNA as it dries, effectively "shrink-wrapping" the sample in a protective coating. Drying can occur at room temperature. Stored dry at ambient temperatures, the protected blood can be safely archived for extended time periods.

Blood DNA stored with the QIAsafe DNA Blood matrix is stable for years at room temperature. Sample integrity is optimized when the plates or tubes are stored in the supplied moisture-barrier bags with desiccant.

Blood can be recovered from the QIAsafe DNA Blood matrix through a simple rehydration protocol and is ready for immediate DNA purification.

DNA can be purified from the rehydrated blood using a variety of different QIAGEN kits for manual or automated DNA purification. The QIAamp DNA Blood Mini Kit and QIAamp DNA Mini Kit provide easy manual protocols. Both protocols are fully automatable on the QIAcube®. Automation on EZ1® workstations provides purification of DNA from 1–6 samples per run using EZ1 DNA Blood Kits. For higher throughputs, the QIAsymphony® SP can process 1–96 samples per run using the QIAsymphony DNA Mini Kit.

Equipment and Reagents to Be Supplied by User

When working with chemicals, always wear a suitable lab coat, disposable gloves, and protective goggles. For more information, consult the appropriate material safety data sheets (MSDSs), available from the product supplier.

For storage of samples in QIAsafe DNA Blood Tubes or Plates

- Pipets and pipet tips (pipet tips with aerosol barriers for preventing cross-contamination are recommended)
- Recommended: Laminar flow hood or a ventilated incubator set to 40°C
- Shaker with an adapter for a microplate
- Heat sealer
- Optional: Dry storage cabinet with relative humidity below 40% (e.g., dry storage cabinets from Biomatrica; see www.biomatrica.com/drystoragecabinets.php)*

For purification of DNA from QIAsafe DNA Blood Tubes or Plates

- Pipets and pipet tips (pipet tips with aerosol barriers for preventing cross-contamination are recommended)
- QIAsafe DNA Blood Rehydration Set
- Thermal shaker with an adapter for a microplate
- QIAamp DNA Blood Mini Kit (cat. no. 51104), QIAamp DNA Mini Kit (cat. no. 51304), EZ1 DNA Blood 200 µl Kit (cat. no. 951034), or QIAsymphony DNA Mini Kit (cat. no. 931236)

* This is not a complete list of suppliers and does not include many important vendors of biological supplies.

Protocol: Sample Drying and Storage

The QIAsafe DNA Blood matrix is formulated so that, upon application of liquid samples, the matrix dissolves and forms a protective coating. The sample must then be completely dried for maximum protection and stability during storage at ambient temperatures.

Important points before starting

- For optimal protection in the QIAsafe DNA Blood matrix, do not apply more than a total of 200 µl blood per well or tube. Samples should be dried in a laminar flow hood or in a ventilated incubator set to 40°C. At an elevated relative humidity >50%, drying time may be significantly prolonged. Blood samples applied into wells or tubes containing the QIAsafe DNA Blood matrix must be dried completely for optimal storage at room temperature.
- Fresh or frozen whole blood collected with EDTA, sodium citrate, or heparin as anticoagulants can be used.
- Always wear gloves when handling QIAsafe DNA Blood Tubes or Plates to avoid contamination.

Procedure

1. **Remove the seal or cap, and gently apply 50–200 µl of whole blood into the center of the vessel containing the QIAsafe DNA Blood matrix.**

   The QIAsafe DNA Blood matrix is supplied as a coating on the bottom of each well or tube.

   Note: If storing 50–100 µl blood in a well of a QIAsafe DNA Blood 48-Well Plate, first add 50 µl nuclease-free water and then the blood sample to the well.

2. **Mix the sample by placing the QIAsafe DNA Blood 48-Well Plate or Tube (placed in the provided tube carrier plate) on a microplate shaker, and shake for 15 min at 600 rpm.**

   To avoid cross-contamination of samples, do not shake at higher speeds.

3. **Dry the uncovered sample completely under a laminar flow at room temperature (15–25°C) or by placing in a ventilated incubator or oven set to 40°C.**

   Drying times are dependent on the blood volume and the drying conditions. Approximate drying times are given in Tables 1 and 2 on page 11. However, to ensure complete drying, we recommend drying the samples overnight (i.e., >16 h) using a laminar flow hood at room temperature or a ventilated incubator set to 40°C.

Table 1. Approximate drying times in a laminar flow hood

	Approximate drying time (h)	
Sample volume (µl)	**Tubes**	**48-well plates**
50	4	–
100	6	7
200	8	14

Table 2. Approximate drying times in a ventilated incubator at 40°C

	Approximate drying time (h)	
Sample volume (µl)	**Tubes**	**48-well plates**
50	3	–
100	5	4
200	6	7

Note: Drying times in Table 1 and Table 2 are only estimations. Depending on the relative humidity, drying times may vary significantly. Drying should occur at 15–40°C with relative humidity below 50%. Please be aware that drying in a nonventilated incubator leads to elevated relative humidity.

4. **Cover the samples after drying.**

   After complete sample drying, plates should be covered with an AirPore Tape Sheet (provided). QIAsafe DNA Blood Tubes can be closed using the caps supplied with the tubes.

5. **Place the samples including a desiccant in a heat-sealed moisture-barrier bag.**

   Remove a desiccant packet from the protective bag and place it together with the sample in the moisture-barrier bag. Make sure that the color-indicator beads of the desiccants are dark blue (pink beads indicate exposure to moisture; in this case, the desiccants should not be used). Moisture-exposed desiccant packets can be recovered by placing them in a ~110°C oven until they turn dark blue.

   For extended storage times (>6 months), moisture-barrier bags should be heat-sealed. Alternatively, tubes or plates may be stored in a dry storage cabinet with relative humidity below 40% (see "Equipment and Reagents to Be Supplied by User", page 9). Relative humidity above 50% for extended periods of time will reduce product performance and sample protection.

Protocol: Sample Recovery

Genomic DNA from whole blood stored in QIAsafe DNA Blood Tubes or 48-Well Plates can be recovered by following this protocol. After rehydration, the DNA can be purified using standard DNA purification protocols for whole blood. We recommend using one of the protocols listed in Table 4 (page 13).

Things to do before starting

- Pipet 4.4 ml Protease Resuspension Buffer into the vial containing lyophilized QIAGEN Protease, as indicated on the label. Dissolved QIAGEN Protease is stable for up to 2 months when stored at 2–8°C. Storage at –20°C is recommended to prolong the life of QIAGEN Protease, but repeated freezing and thawing should be avoided. For this reason, storage of aliquots of QIAGEN Protease is recommended.
- Prepare a rehydration solution by mixing 44 µl reconstituted QIAGEN Protease with 286 µl RNase-free water per sample. Use Table 3 as a guide. Always prepare fresh rehydration solution.

Table 3. Preparing rehydration solution

No. of samples	Volume of RNase-free water (µl)	Volume of QIAGEN Protease (µl)
1	286	44
12	3432	528
24	6864	1056
48	13,728	2112

Procedure

1. **Add 300 µl rehydration solution (see Table 3) directly to the dried blood in a QIAsafe DNA Blood Tube or a well of a QIAsafe DNA Blood 48-Well Plate.**

   Individual wells in a plate can be opened by puncturing the AirPore Tape Sheet with a pipette tip or razor blade.

2. **Place the plate or the tubes (placed in the supplied tube carrier plate) on a thermal shaker, and incubate at 56°C with continuous shaking at 600 rpm until the blood is rehydrated.**

   Rehydration time is dependent on the original blood volume and the storage time, and may vary from 2 to 45 min until the sample returns to liquid form.

To avoid cross-contamination of samples, do not shake at higher speeds.

3. **Follow the kit protocol for manual or automated purification of DNA from blood.**

   Table 4 lists QIAGEN kits that can be used for the purification protocol.

   The rehydrated blood should be treated as fresh blood. DNA can be purified without any further dilution or pretreatment of the rehydrated blood.

Table 4. QIAGEN kits for DNA purification*

Kit	Automation	Protocol	Cat. no.
QIAamp DNA Blood Mini Kit	Manual or automated on the QIAcube	Blood and body fluid	51104
QIAamp DNA Mini Kit	Manual or automated on the QIAcube	Blood and body fluid	51304
EZ1 DNA Blood 200 µl Kit	EZ1 workstations	DNA Blood 200	951034
QIAsymphony DNA Mini Kit	QIAsymphony SP	Blood 200 FIX	931236

* This table shows only a selection of QIAGEN kits that can be used with QIAsafe DNA Blood Tubes and Plates. To find out more about other QIAGEN genomic DNA purification kits, such as kits for high-throughput 96-well purification, please visit www.qiagen.com/DNA.

Note: If only some wells of a QIAsafe DNA Blood 48-Well Plate were rehydrated and if the plate will be returned to storage, make sure that the color-indicator beads of the desiccant are blue. If the beads are pink, either use a fresh desiccant or recover the desiccant by placing it in a ~110°C oven until the beads turn dark blue. If the plate will be stored for longer than 6 weeks, heat-seal the moisture-barrier bag again.

Troubleshooting Guide

This troubleshooting guide may be helpful in solving any problems that may arise. For more information, see also the Frequently Asked Questions page at our Technical Support Center: www.qiagen.com/FAQ/FAQList.aspx. The scientists in QIAGEN Technical Services are always happy to answer any questions you may have about either the information and protocols in this handbook or sample and assay technologies (for contact information, see back cover or visit www.qiagen.com).

	Comments and suggestions
Eluate contains degraded DNA or little or no DNA	
a) Samples not properly dried	Samples must be completely dried before storage. See Tables 1 and 2 for guidelines in "Protocol: Sample Drying and Storage" (page 11).
b) Moisture-barrier bags not heat-sealed	Moisture-barrier bags must be heat-sealed to prevent moisture reaching the sample.
c) Sample stored in a humid environment	Use desiccant packets and heat-sealed moisture-barrier bags to maintain samples at low humidity.
d) Low amount of DNA in initial sample	DNA yield depends on the blood volume and the white blood cell count of the original sample.
e) Inappropriate DNA purification method	Check the protocol for DNA purification. We recommend using a method listed in Table 4 in "Protocol: Sample Recovery" (page 13).
Desiccant bead color is pink	
Desiccant exposed to humidity	Use a fresh desiccant packet or recover used desiccant by placing it in a ~110°C oven until the indicator beads turn dark blue.
Blood is not completely dry after overnight drying	
a) Too many plates dried simultaneously	Avoid drying too many samples at the same time, since this leads to elevated humidity, which results in prolonged drying times. Extend the drying time until all samples are completely dry.

	Comments and suggestions
b) No ventilation	Thorough ventilation is essential for complete drying of the samples. Dry the samples either in a ventilated incubator set to 40°C or in a laminar flow hood at room temperature. Extend the drying time until all samples are completely dry.
c) Humidity too high	Drying of the samples should occur at relative humidity below 50%. If the relative humidity is higher, we recommend drying samples in a ventilated incubator set to 40°C.
Blood does not rehydrate within 45 min	
a) Inappropriate sample storage	Storage at elevated temperatures (>30°C) as well as elevated relative humidity (>40%) may lead to prolonged sample rehydration as well as loss of sample integrity. To rehydrate difficult samples, extend the rehydration time.
b) Difficult samples	Some samples stored for extremely long periods of time may be more difficult to rehydrate. Extend the rehydration time to 1–2 h and, if using QIAsafe DNA Blood 48-Well Plates, add an additional 300 µl of rehydration solution.

Appendix: Determination of Concentration, Yield, and Purity

DNA yield is determined from the concentration of DNA in the eluate, measured by absorbance at 260 nm. Absorbance readings at 260 nm should fall between 0.1 and 1.0 to be accurate. Sample dilution should be adjusted accordingly: for example, an eluate containing 25–50 ng DNA/µl (A_{260} = 0.5–1.0) should not be diluted with more than 4 volumes of buffer. Use elution buffer or water (as appropriate) to dilute samples and to calibrate the spectrophotometer. Measure the absorbance at 260 and 280 nm, or scan absorbance from 220 to 320 nm (a scan will show if there are other factors affecting absorbance at 260 nm). Both DNA and RNA are measured with a spectrophotometer; to measure only DNA, a fluorimeter must be used.

Purity is determined by calculating the ratio of absorbance at 260 nm to absorbance at 280 nm. Pure DNA has an A_{260}/A_{280} ratio of 1.7–1.9.

References

QIAGEN maintains a large, up-to-date online database of scientific publications utilizing QIAGEN products. Comprehensive search options allow you to find the articles you need, either by a simple keyword search or by specifying the application, research area, title, etc.

For a complete list of references, visit the QIAGEN Reference Database online at www.qiagen.com/RefDB/search.asp or contact QIAGEN Technical Services or your local distributor.

Ordering Information

Product	Contents	Cat. no.
QIAsafe DNA Blood Tubes (50)	For 50 samples: QIAsafe DNA Blood Tubes, QIAsafe DNA Blood Tube Carrier Plate, QIAsafe Desiccant, and QIAsafe Moisture Barrier Bags	159134
QIAsafe DNA Blood 48-Well Plates (10)	For 10 x 48 samples: QIAsafe DNA Blood 48-Well Plates, AirPore Tape Sheets, QIAsafe Desiccant, and QIAsafe Moisture Barrier Bags	159142
QIAsafe DNA Blood Rehydration Set (100)	For 100 samples: QIAGEN Protease, Protease Resuspension Buffer, and RNase-Free Water	159155
Accessories		
AirPore Tape Sheets (50)	50 AirPore Tape Sheets	19571
Desiccant (1000)	1000 Desiccant Packets (1 g each)	159320
Related products for DNA purification		
QIAamp DNA Blood Mini Kit — for purification of up to 12 µg genomic, mitochondrial, or viral DNA from blood and related body fluids		
QIAamp DNA Blood Mini Kit (50)	For 50 DNA minipreps: 50 QIAamp Mini Spin Columns, QIAGEN Protease, Reagents, Buffers, Collection Tubes (2 ml)	51104
QIAamp DNA Blood Mini Kit (250)	For 250 DNA minipreps: 250 QIAamp Mini Spin Columns, QIAGEN Protease, Reagents, Buffers, Collection Tubes (2 ml)	51106
QIAamp DNA Mini Kit — for isolation of genomic, mitochondrial, bacterial, parasite, or viral DNA		
QIAamp DNA Mini Kit (50)	For 50 DNA preps: 50 QIAamp Mini Spin Columns, QIAGEN Proteinase K, Reagents, Buffers, Collection Tubes (2 ml)	51304

Product	Contents	Cat. no.
QIAamp DNA Mini Kit (250)	For 250 DNA preps: 250 QIAamp Mini Spin Columns, QIAGEN Proteinase K, Reagents, Buffers, Collection Tubes (2 ml)	51306
EZ1 DNA Blood 200 µl Kit — for automated purification of DNA from 1–6 samples or 1–14 samples per run		
EZ1 DNA Blood 200 µl Kit (48)	For 48 preps: Reagent Cartridges (Blood 200 µl), Disposable Filter-Tips, Disposable Tip-Holders, Sample Tubes (2 ml), Elution Tubes (1.5 ml)	951034
QIAsymphony DNA Kits — for automated purification of DNA from 1–96 samples		
QIAsymphony DNA Mini Kit (192)	For 192 preps of 200 µl each: Includes 2 reagent cartridges and enzyme racks and accessories	931236
Related products for DNA storage		
QIAsafe DNA Tubes and 96-Well Plates — for room temperature storage of DNA		
QIAsafe DNA Tubes (50)	50 QIAsafe DNA Tubes in moisture-barrier foil packages	159104
QIAsafe DNA 96-Well Plates (10)	10 QIAsafe DNA 96-Well Plates in moisture-barrier foil packages, 10 QIAsafe Seals	159112

For up-to-date licensing information and product-specific disclaimers, see the respective QIAGEN kit handbook or user manual. QIAGEN kit handbooks and user manuals are available at www.qiagen.com or can be requested from QIAGEN Technical Services or your local distributor.

Trademarks: QIAGEN®, QIAamp®, QIAcube®, QIAsafe®, QIAsymphony®, EZ1® (QIAGEN Group); SampleMatrix® (Biomatrica, Inc.).

Limited License Agreement

Use of this product signifies the agreement of any purchaser or user of QIAsafe DNA Blood Tubes or QIAsafe DNA Blood 48-Well Plates to the following terms:

1. QIAsafe DNA Blood Tubes or QIAsafe DNA DNA Blood 48-Well Plates may be used solely in accordance with the *QIAsafe DNA Blood Handbook* and for use with components contained in the Kit only. QIAGEN grants no license under any of its intellectual property to use or incorporate the enclosed components of this Kit with any components not included within this Kit except as described in the *QIAsafe DNA Blood Handbook* and additional protocols available at www.qiagen.com.
2. Other than expressly stated licenses, QIAGEN makes no warranty that this Kit and/or its use(s) do not infringe the rights of third-parties.
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Austria ■ Orders 0800/28-10-10 ■ Fax 0800/28-10-19 ■ Technical 0800/28-10-11

Belgium ■ Orders 0800-79612 ■ Fax 0800-79611 ■ Technical 0800-79556

Brazil ■ Orders 0800-557779 ■ Fax 55-11-5079-4001 ■ Technical 0800-557779

Canada ■ Orders 800-572-9613 ■ Fax 800-713-5951 ■ Technical 800-DNA-PREP (800-362-7737)

China ■ Orders 021-3865-3865 ■ Fax 021-3865-3965 ■ Technical 800-988-0325

Denmark ■ Orders 80-885945 ■ Fax 80-885944 ■ Technical 80-885942

Finland ■ Orders 0800-914416 ■ Fax 0800-914415 ■ Technical 0800-914413

France ■ Orders 01-60-920-926 ■ Fax 01-60-920-925 ■ Technical 01-60-920-930 ■ Offers 01-60-920-928

Germany ■ Orders 02103-29-12000 ■ Fax 02103-29-22000 ■ Technical 02103-29-12400

Hong Kong ■ Orders 800 933 965 ■ Fax 800 930 439 ■ Technical 800 930 425

Ireland ■ Orders 1800 555 049 ■ Fax 1800 555 048 ■ Technical 1800 555 061

Italy ■ Orders 02-33430-420 ■ Fax 02-33430-426 ■ Technical 800-787980

Japan ■ Telephone 03-6890-7300 ■ Fax 03-5547-0818 ■ Technical 03-6890-7300

Korea (South) ■ Orders 1544 7145 ■ Fax 1544 7146 ■ Technical 1544 7145

Luxembourg ■ Orders 8002-2076 ■ Fax 8002-2073 ■ Technical 8002-2067

Mexico ■ Orders 01-800-7742-639 ■ Fax 01-800-1122-330 ■ Technical 01-800-7742-639

The Netherlands ■ Orders 0800-0229592 ■ Fax 0800-0229593 ■ Technical 0800-0229602

Norway ■ Orders 800-18859 ■ Fax 800-18817 ■ Technical 800-18712

Singapore ■ Orders 65-67775366 ■ Fax 65-67785177 ■ Technical 65-67775366

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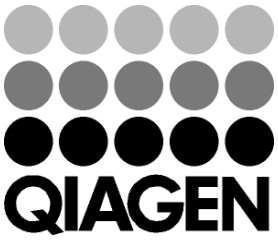

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